

**REMARKS**

Claims 1-20 are pending in the application.

Applicant has amended the specification and the drawings. The changes to the specification and drawings made herein are not believed to introduce any new matter.

Applicant's responses to the issues raised in the Final Office Action are set forth in the following discussion.

**Objections to the Drawings**

Applicant respectfully requests reconsideration of the objection to the drawings as failing to comply with 37 CFR 1.84(p)(5) based on the allegation that the drawings include certain reference characters not mentioned in the description. Applicant respectfully traverses the Examiner's characterization of the cited items as being reference characters. Nevertheless, to expedite prosecution of the subject application, Applicant has amended the specification to include the items cited by the Examiner, except for those associated with Figure 11B. Regarding Figure 11B, Applicant notes that this figure, which shows a side view of the MRAM array shown in Figure 11A, is not necessary for an understanding of the claimed subject matter. As such, Applicant respectfully submits that 37 CFR 1.84(p)(5) does not require that everything shown in Figure 11B be designated with reference numbers. Accordingly, Applicant submits that the drawings now comply with 37 CFR 1.84(p)(5) and requests that the objection to the drawings thereunder be withdrawn.

Applicant respectfully requests reconsideration of the objection to the drawings as failing to comply with 37 CFR 1.84(p)(5) based on the allegation that the drawings do not include reference sign 1102, which is used in the specification to designate a shielding magnet. Applicant respectfully directs the Examiner's attention toward Figure 11A, which includes reference sign 1102. Accordingly, Applicant submits that the drawings comply with

37 CFR 1.84(p)(5) and requests that the objection to the drawings based on the absence of reference sign 1102 be withdrawn.

Applicant respectfully requests reconsideration of the objection to the drawings as failing to comply with 37 CFR 1.84(p)(4) because reference character 1100 has been used to designate two different items. In response to the objection, Applicant has amended Figure 11B to delete the incorrect reference character 1100 therefrom (the correct reference character 1100 remains in the figure). Accordingly, Applicant submits that the drawings now comply with 37 CFR 1.84(p)(4) and requests that the objection to the drawings thereunder be withdrawn.

**Rejection Under 35 U.S.C. § 112, First Paragraph**

Applicant respectfully requests reconsideration of the rejection of claims 1-20 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. In support of this allegation, the Examiner cites several items that are shown in the drawings but not mentioned in the specification. These items, which have now been added to the specification, would not prevent one having ordinary skill in the art from ascertaining how to make and use the claimed subject matter based on Applicant's specification and drawings. In addition, the Examiner alleges that one having ordinary skill in the art would not understand equation (2) in the specification because certain variables are not mentioned in the specification. The meaning of the variables cited by the Examiner is illustrated in Figure 10, and the variables have now been added to the specification. Moreover, Applicant is not claiming equation (2) *per se*, but instead cites the equation to illustrate exemplary properties of MRAM cells. Applicant's specification and drawings provide one having ordinary skill in the art with sufficient information to make and use the claimed subject matter. Accordingly, as claims 1-20 are supported by an enabling description, Applicant respectfully requests that the rejection of claims 1-20 under 35 U.S.C. § 112, first paragraph, be withdrawn.

**Obviousness Rejection Under 35 U.S.C. § 103(a)**

Applicant respectfully requests reconsideration of the rejection of claims 1-20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. US 6,114,719 to Dill et al. For the reasons explained below, the Dill et al. reference does not raise a *prima facie* case of obviousness against independent claims 1, 8, and 15.

Independent claims 1, 8, and 15 respectively define a magnetic random access memory (MRAM) cell, an MRAM array, and a method for programming an MRAM. Among other features, a magnetic junction tunnel (MTJ) device is defined to have a perpendicular magnetic orientation.

In support of the obviousness rejection, the Examiner alleges that the Dill et al. reference discloses or suggests an MTJ device that has a perpendicular magnetic orientation, as specified in independent claims 1, 8, and 15. Applicant respectfully traverses the Examiner's characterization of Dill et al. relative to independent claims 1, 8, and 15 because the portion of the reference relied upon by the Examiner (Figure 6) does not disclose or suggest an MTJ device that has a perpendicular magnetic orientation. In particular, the Dill et al. reference discloses that “[a]ll of the layers of the MTJ 100 are grown in the presence of a magnetic field applied *parallel* to the surface of the substrate” (column 9, lines 6-8 (emphasis added)). In addition, the Dill et al. reference defines MTJ memory cells with first and second ferromagnetic layers, with “the first ferromagnetic layer having a magnetization direction that is generally fixed in a plane *parallel* to the substrate surface and the second ferromagnetic layer” (column 18, lines 33-40 (emphasis added)). Further, in the Dill et al. reference, the magnetization direction of magnetic moment 151 (see Figure 2) is also parallel to the surface. In contrast, independent claims 1, 8, and 15 define an MTJ device that has a *perpendicular* magnetic orientation. As the Dill et al. reference discloses an MTJ device that has a different magnetic orientation, the Dill et al. reference cannot reasonably be considered

to disclose or suggest the MTJ device having a perpendicular magnetic orientation, as defined in independent claims 1, 8, and 15.

To establish a *prima facie* case of obviousness, the cited references must disclose or suggest all the claim features. Here, for the reasons set forth above, the Dill et al. reference does not disclose or suggest all of the features of the claimed subject matter. Accordingly, Applicant submits that independent claims 1, 8, and 15 are patentable under 35 U.S.C. §103(a) over Dill et al. Claims 2-7, 9-14, and 16-20, each of which depends from one of independent claims 1, 8, or 15, are likewise patentable under 35 U.S.C. §103(a) over Dill et al. for at least the same reasons set forth above regarding the applicable independent claim.

**Conclusion**

In view of the foregoing, Applicant respectfully requests reconsideration and reexamination of claims 1-20, and submits that these claims are in condition for allowance. Accordingly, a Notice of Allowance is respectfully requested. In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 749-6902. If any additional fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 50-0805 (Order No. MXICP017).

Respectfully submitted,  
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